Small Business Innovation Research/Small Business Tech Transfer

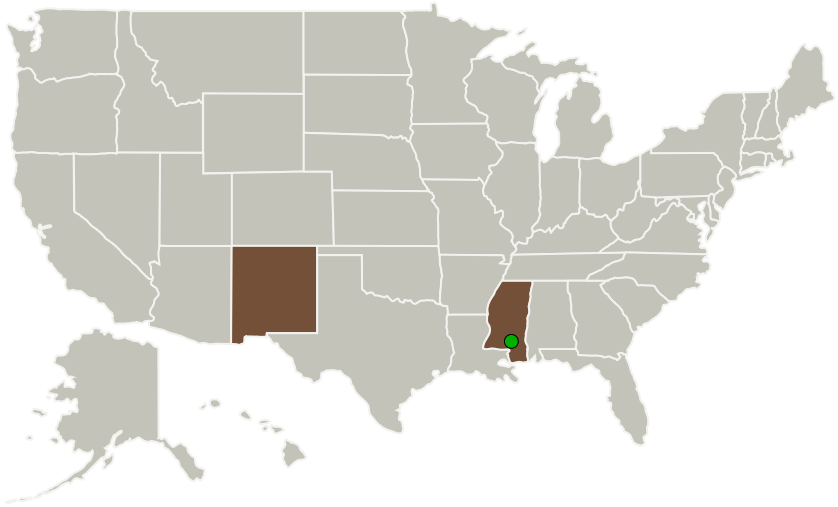
High-Speed Diagnostic Measurements of Inlet and Exhaust Flows, Phase I

Completed Technology Project (2013 - 2013)

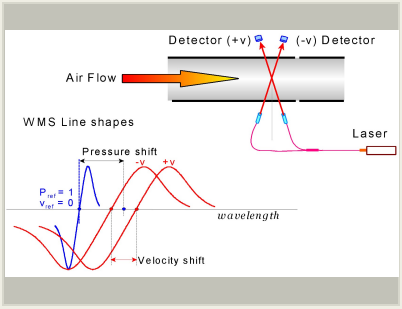
Project Introduction

The development of rocket-based and turbine-based combined cycle engines are a high priority for transportation into space. In order to test components and systems, and certify life cycles for these engines, non-intrusive flow diagnostics are required. In particular, high-speed measurements of pressure, velocity, and temperature profiles across both inlet and outlet ducts of these engines would provide a better understanding of engine performance. Southwest Sciences, Inc. proposes to develop a high-speed, non-intrusive monitor to measure such flows. This fiber optic sensor is based on a novel approach derived from wavelength modulation spectroscopy, in which high bandwidth measurements can be acquired and processed with simple electronics. Phase I will focus on validating the proposed technique and in Phase II, a fully operational prototype will be constructed, tested and delivered to NASA.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Southwest Sciences, Inc.	Lead Organization	Industry	Santa Fe, New Mexico
Stennis Space Center(SSC)	Supporting Organization	NASA Center	Stennis Space Center, Mississippi



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Primary U.S. Work Locations	
Mississippi	New Mexico

Project Transitions

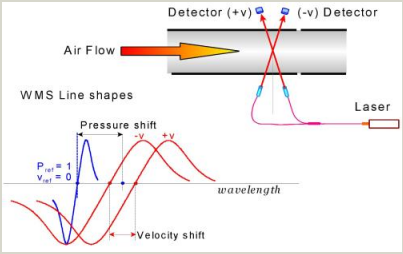
May 2013: Project Start

November 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138577)*

Images



Project Image
High-Speed Diagnostic Measurements of Inlet and Exhaust Flows
(https://techport.nasa.gov/image/130544)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Southwest Sciences, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

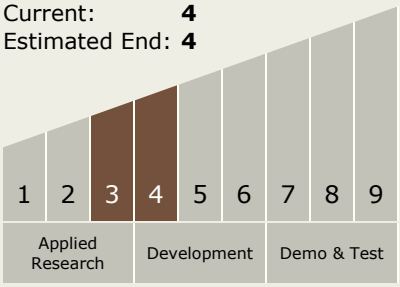
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Joel A Silver

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.6 Cryogenic / Thermal

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System